"Multi-Band" Solar Cell Technology Wins R&D 100 Award and is Licensed for Commercial Applications

The LBNL multiband technology (see highlight, attached) has been named a 2006 R&D 100 Award winner. It was selected by R&D Magazine as one of the most "significant proven technological advances of the year." Confirming this potential, RoseStreet Labs has obtained an exclusive license the technology from LBNL. This license complements and expands the Phoenix based company's existing exclusive license for full spectrum solar cells utilizing unique multijunction technology developed jointly by LBNL and Cornell University. RoseStreet Labs believes that Berkeley Lab's technology can potentially achieve efficiencies above 48% in a single junction device and represents a technical breakthrough that may significantly reduce the complexity and manufacturing costs associated with high solar efficiencies.

Rose Street Labs is a supplier of products and services for wireless infrastructure in the renewable energy, homeland security markets and life sciences. It believes that the LBNL technology represents a breakthrough in multi-band semiconductor materials and that it will lead to leapfrog advances in solar cell applications, such as high-efficiency products for a broad range of renewable energy applications—at a cost close to prevailing conventional silicon based cells, but with significantly higher efficiencies.

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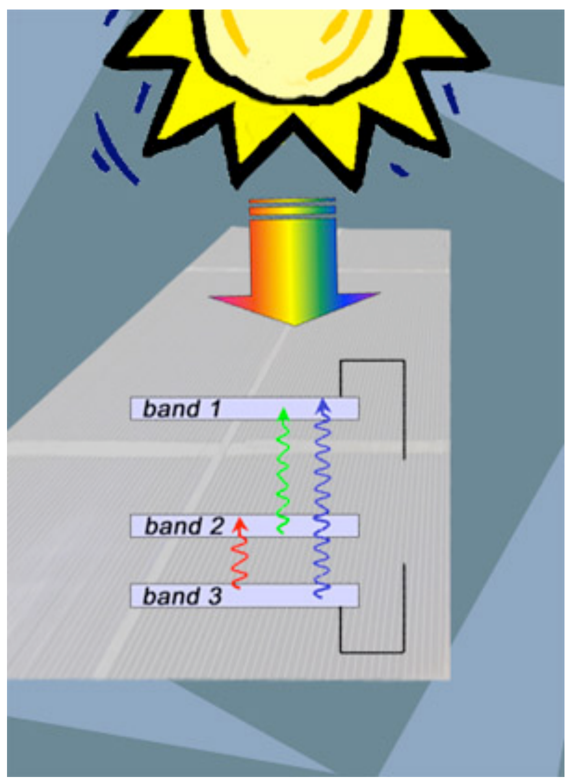
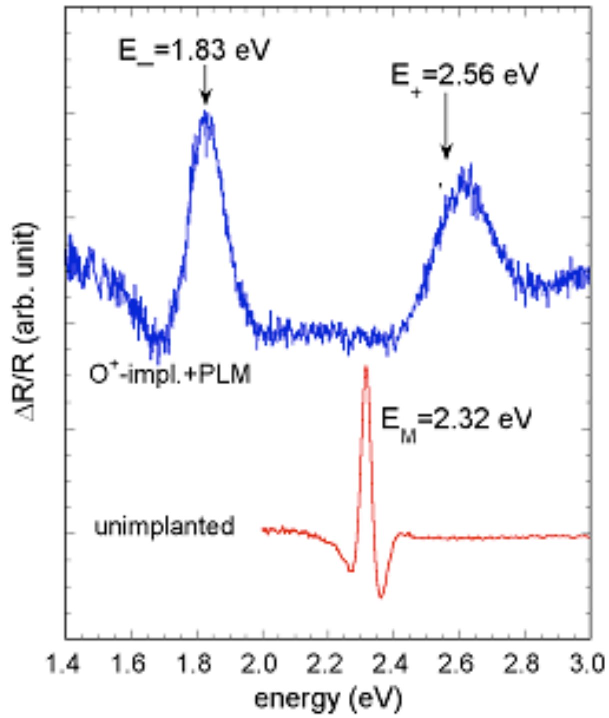


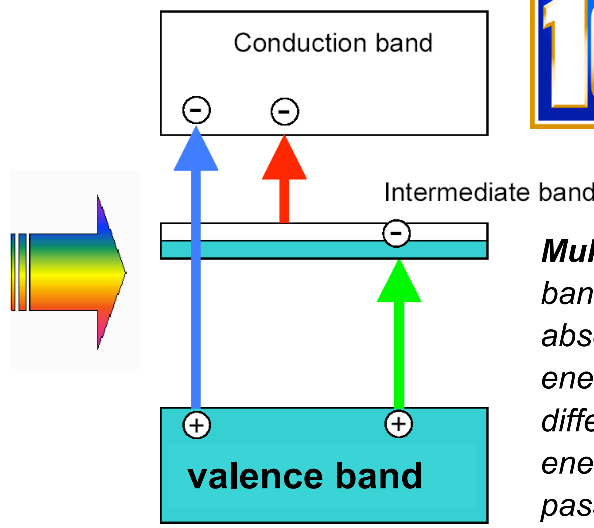
A High-efficiency Multiband Material for Solar Cells can convert most of the sun's widespread energy into electricity with a single layer of semiconductor.

Multi-Band Semiconductors for High Efficiency Solar Cells

Conversion efficiencies surpassing 50% are possible

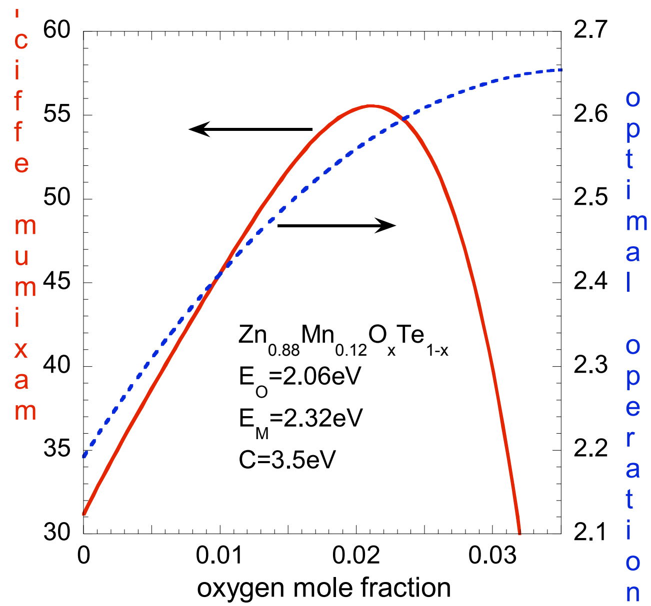
Update: Winner of 2006 R&D 100 Award





Multiband Solar Cell. *The intermediate band acts as a "stepping stone," allowing absorption of photons at three different energy levels, corresponding to the three different band gaps. In particular, low-energy photons are captured that would pass through a conventional solar cell.*

Optical reflectance *data that demonstrates successful synthesis of a multiband semiconductor. As grown $Zn_{0.88}Mn_{0.12}Te$ has a band gap of 2.32 eV (red trace). Replacement of a small fraction of the Te atoms by O splits the conduction band into two, producing two transitions (blue trace).*



Optimization calculations *predict an ultimate efficiency for this 3-band design of over 50%. The operating voltage can be controlled, as well, by adjusting the positions of the three bands by appropriate alloying.*

W. Walukiewicz and K. M. Yu, 04-1 update